Menlo Park Notebook #58 [N-80-01-31]

This notebook covers the period January-February 1880. The entries are by Charles L. Clarke and relate primarily to copper conductors for electric lighting. The name "Clarke" is inscribed on the inside front cover. The book contains 284 numbered pages. Pages 94-265 consist of skeleton tables that were never filled in. These have not been filmed.

Blank pages not filmed: 68-69, 266-273.

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Jan. 31, 1880.

D'Aubuisson's Hydraulics

Water at 60° F weighs 62.39 lbs. per cubic foot.

Specific gr. of Copper as given by Clark and Sabine "according to best authorities" is 8.899.

Weight of cubic foot of copper therefore is 555.2 lbs. and will be assumed as 555 lbs. This is the weight given by Molesworth but other authorities vary, Sprague also gives it as 555 lbs. per cu. ft.

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By Dr. Matthiessen the resistance of chemically pure annealed copper wire per grain-foot is .2064 ohms at 0°C.

This assumes the conductivity as 100, assuming it to be 97, the resistance per foot-grain is .2127835 Ohms, at 0°C.

To reduce this to resistance at 60°F or $15\frac{5}{9}$°C apply Matthiessen's formula

$$R = r(1 + at + bt^2),$$

$$R = .2127835\left\{1 + 15\tfrac{5}{9}(.003824) + \left(15\tfrac{5}{9}\right)^2(.0000012)\right\}$$

$$R = .2127835\left\{1 + .059484\tfrac{4}{9} + .0003048\tfrac{32}{81}\right\},$$

$$R = .2127835\left(1.059789\tfrac{1}{3}\right).$$

3

$R = .22555$ Ohms per grain-foot at 60°F with copper having a conductivity of 97.

$\frac{10000}{.2255} = 4.43759$ is the no. of feet of grain-foot wire giving a resistance of one ohm.

$\pi = 3.1415926 5$

.0000007853981625 = Area of 1 mil in sq. in.

.000009424777795 = Contents of mil-foot in cu. in.

.0000000545415 = Contents of mil-foot in cu. ft.

×555 =

.0000302705325 = Weight of mil-foot in lbs.

×7000 =

.021189372 75 = Weight of mil-foot in grains.

We have then the weight of mil-foot in grains $= .021189937275$, then in one grain-foot there will be 47.193469 mil-feet.

As the resistance per grain-foot $= .2255$ ohms (page 3), the resistance per mil-foot $=$

$$.2255(47.193469) =$$

$$10.642127259 5 \text{ Ohms.}$$

This last result is the quotient of $\frac{U}{M}$ in which $M = .021189937275$ grains and $U = .2255$ ohms (See Sprague, page 182).

We then have:

$$R = 10.642127259 5 \frac{l}{d^2}.$$

$$\therefore d = \sqrt{\frac{(10.642127259 5)l}{R}}$$

$=$ diameter in mils.

Weight per foot in grains $= w = d^2 M$ $\therefore$ weight of a length l will be

$$W = d^2 M l,$$

$$W = .021189\, d^2 l, \text{ in grains.}$$

$$W = .000003027\, d^2 l, \text{ in lbs.}$$

Using the formula on page 4

$$d = \sqrt{\frac{(10.642127259 5)l}{R}}$$

we have when:—

$R = \frac{1}{2}$ ohm,

$$d^2 = 21.284254519 0\, l,$$

$$d = 4.612486\sqrt{l},$$

When $R = 1$ ohm,

$$d^2 = 10.642127259 5\, l,$$

$$d = 3.262223\sqrt{l},$$

When $R = 1\frac{1}{2}$ ohms.

$$d^2 = 7.094175\, l,$$

$$d = 2.6636\sqrt{l},$$

When $R = 2$ ohms,

$I^2 = 5.321063629751,$

$I = 2.306743\sqrt{l},$

When $R = 2\frac{1}{2}$ ohms,

$I^2 = 4.256850903851,$

$I = 2.06321 37\sqrt{l},$

When $R = 3$ ohms

$I^2 = 3.547375753871.$

$I = 1.88345\sqrt{l}.$

When $R = 3\frac{1}{2}$ ohms.

$I^2 = 3.040607788 l,$

$I = 1.74373\sqrt{l},$

When $R = 4$ ohms.

$I^2 = 2.660531814871,$

$I = 1.631115\sqrt{l},$

When $R = 4\frac{1}{2}$ ohms,

$I^2 = 2.364917169 l,$

$I = 1.53783\sqrt{l}.$

When $R = 5$ ohms,

$I^2 = 2.128425454519 l,$

$I = 1.45891\sqrt{l},$

When $R = 6$ ohms,

$I^2 = 1.773687876 6 l,$

$I = 1.33179\sqrt{l},$

When $R = 7$ ohms,

$I^2 = 1.520303895 56 l,$

$I = 1.23298\sqrt{l},$

When $R = 8$ ohms,

$I^2 = 1.330265907 4 l,$

$I = 1.15348 3\sqrt{l},$

When $R = 9$ ohms,

$I^2 = 1.182458558 44 l,$

$I = 1.08741\sqrt{l},$

When $R = 10$ ohms,

$I^2 = 1.064212725 95 l,$

$I = 1.0316\sqrt{l},$

Page 5 we have the weight of any length of wire

$W = .00000 3027\, d^2 l$, in lbs.

Substituting the values of d^2 which have just been given we have

When $R = \frac{1}{2}$ ohm,

$W = .000064427944\, l^2$, in lbs.

When $R = 1$ ohm,

$W = .00003221372\, l^2$, in lbs.

When $R = 1\frac{1}{2}$ ohms,

$W = .000021475881\, l^2$, in lbs.

When $R = 2$ ohms,

$W = .000016106856\, l^2$, in lbs.

When $R = 2\frac{1}{2}$ ohms,

$W = .000012885 5\, l^2$, in lbs.

When $R = 3$ ohms,

$W = .000010738\, l^2$, in lbs.

When $R = 4$ ohms,

$W = .000008053 43\, l^2$, in lbs.

When $R = 5$ ohms,

$W = .000006442 74\, l^2$, in lbs.

When $R = 6$ ohms,

$W = .000005369\, l^2$, in lbs.

When $R = 7$ ohms,

$W = .000004602\, l^2$, in lbs.

When $R = 8$ ohms,

$W = .000004026 7\, l^2$, in lbs.

When $R = 9$ ohms,

$W = .000003579 3\, l^2$, in lbs.

When $R = 10$ ohms,

$W = .000003221372\, l^2$, in lbs.

In order to facilitate calculation of the tables the values of I will be taken only to four decimal places, and the values of W will be taken only to the first four digits. We then have for the values of I and W by which these tables are made:-

		Logarithms of Constants
$R = \frac{1}{2}$ ohm	$I = 4.6135\sqrt{l}$, $W = .00006443\,l^2$,	0.66403 $\bar{5}.80909$
$R = 1$ ohm	$I = 3.2622\sqrt{l}$, $W = .00003221\,l^2$,	0.51351 $\bar{5}.50799$
$R = 1\frac{1}{2}$ ohms	$I = 2.6636\sqrt{l}$, $W = .00002148\,l^2$,	0.42447 $\bar{5}.33203$
$R = 2$ ohms	$I = 2.3067\sqrt{l}$, $W = .00001611\,l^2$,	0.36299 $\bar{5}.20710$
$R = 2\frac{1}{2}$ ohms	$I = 2.0632\sqrt{l}$, $W = .00001289\,l^2$,	0.31454 $\bar{5}.11025$
$R = 3$ ohms	$I = 1.8835\sqrt{l}$, $W = .00001074\,l^2$,	0.27497 $\bar{5}.03100$
$R = 4$ ohms	$I = 1.6311\sqrt{l}$, $W = .00000805\,l^2$,	0.21248 $\bar{6}.90596$
$R = 5$ ohms	$I = 1.4589\sqrt{l}$, $W = .00000644\,l^2$,	0.16403 $\bar{6}.80909$
$R = 6$ ohms	$I = 1.3318\sqrt{l}$, $W = .00000536\,l^2$,	0.12444 $\bar{6}.72988$
$R = 7$ ohms	$I = 1.2330\sqrt{l}$, $W = .00000460\,l^2$,	0.09096 $\bar{6}.66295$
$R = 8$ ohms	$I = 1.1535\sqrt{l}$, $W = .00000402\,l^2$	0.06202 $\bar{6}.60495$
$R = 9$ ohms	$I = 1.0874\sqrt{l}$, $W = .00000357\,l^2$	0.03639 $\bar{6}.55976$
$R = 10$ ohms	$I = 1.0316\sqrt{l}$, $W = .00000322\,l^2$	0.01351 $\bar{6}.50799$

I will be in thousands of an inch. l is in feet. W in lbs.

R Resistance	Length Round	½ Ohm Resistance. Diam. inches	Area sq. in.	Weight per foot lbs.	Total Weight lbs.	Cost
20 ft.	40 ft.	.029	.0007	.0026	.103	
40	80	.041	.0013	.0051	.413	
60	120	.051	.0020	.0077	.928	
80	160	.058	.0027	.0103	1.650	
100	200	.065	.0033	.0129	2.577	
120	240	.072	.0040	.0155	3.711	
140	280	.077	.0047	.0180	5.051	
160	320	.083	.0053	.0206	6.598	
180	360	.088	.0060	.0232	8.350	
200	400	.092	.0067	.0258	10.319	
220	440	.097	.0073	.0283	12.473	
240	480	.101	.0080	.0309	14.845	
260	520	.105	.0087	.0335	17.421	
280	560	.109	.0094	.0361	20.205	
300	600	.113	.0100	.0387	23.195	

½ Ohm Resistance 75				
Diam.	Area	Weight per foot	Total Weight	Cost
.021	.0003	.0013	.052	
.029	.0007	.0026	.206	
.036	.0010	.0039	.464	
.041	.0013	.0052	.825	
.046	.0017	.0065	1.289	
.051	.0020	.0078	1.855	
.055	.0023	.0090	2.525	
.058	.0027	.0103	3.298	
.062	.0030	.0116	4.174	
.065	.0033	.0129	5.154	
.068	.0037	.0142	6.236	
.072	.0040	.0155	7.421	
.074	.0044	.0168	8.710	
.077	.0047	.0180	10.101	
.080	.0050	.0193	11.596	

1½ Ohms Resistance

	Diam.	Area.	Weight per foot	Total Weight	Cost
20	.017	.0002	.0009	.034	
40	.024	.0004	.0017	.135	
60	.029	.0007	.0026	.309	
80	.034	.0009	.0034	.550	
100	.038	.0011	.0043	.859	
120	.041	.0013	.0052	1.237	
140	.045	.0016	.0060	1.684	
160	.048	.0018	.0069	2.200	
180	.051	.0020	.0077	2.784	
200	.053	.0022	.0086	3.437	
220	.056	.0025	.0095	4.159	
240	.058	.0027	.0103	4.949	
260	.061	.0029	.0112	5.808	
280	.063	.0031	.0120	6.736	
300	.065	.0033	.0129	7.733	

2 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost
.015	.0002	.0007	.026	
.021	.0003	.0013	.103	
.025	.0005	.0019	.232	
.029	.0007	.0026	.412	
.033	.0008	.0032	.644	
.036	.0010	.0039	.928	
.039	.0012	.0045	1.263	
.041	.0013	.0052	1.650	
.044	.0015	.0058	2.088	
.046	.0017	.0065	2.578	
.048	.0018	.0071	3.119	
.051	.0020	.0077	3.712	
.053	.0022	.0084	4.356	
.055	.0023	.0090	5.052	
.057	.0025	.0097	5.800	

2½ Ohms Resistance

	Diam.	Area.	Weight per foot.	Total Weight.	Cost.
20	.013	.0001	.0005	.021	
40	.019	.0003	.0010	.083	
60	.023	.0004	.0016	.186	
80	.026	.0005	.0021	.330	
100	.029	.0007	.0026	.516	
120	.032	.0008	.0031	.743	
140	.035	.0009	.0036	1.011	
160	.037	.0011	.0041	1.320	
180	.039	.0012	.0046	1.671	
200	.041	.0013	.0052	2.062	
220	.043	.0015	.0057	2.496	
240	.045	.0016	.0062	2.970	
260	.047	.0017	.0067	3.484	
280	.049	.0019	.0072	4.042	
300	.051	.0020	.0077	4.640	

3 Ohms Resistance.

Diam.	Area.	Weight per foot	Total Weight	Cost
.012	.0001	.0004	.017	
.017	.0002	.0009	.069	
.021	.0003	.0013	.155	
.024	.0004	.0017	.275	
.026	.0005	.0021	.430	
.029	.0007	.0025	.619	
.032	.0008	.0030	.842	
.034	.0009	.0034	1.101	
.036	.0010	.0039	1.392	
.038	.0011	.0043	1.718	
.040	.0012	.0047	2.079	
.041	.0013	.0052	2.475	
.043	.0015	.0056	2.904	
.045	.0016	.0060	3.368	
.046	.0017	.0064	3.866	

4 Ohms Resistance,

	Diam.	Area.	Weight per foot	Total Weight	Cost
20	.010	.00008	.0003	.013	
40	.015	.00016	.0006	.052	
60	.019	.00026	.0010	.116	
80	.021	.00034	.0013	.206	
100	.023	.00042	.0016	.323	
120	.025	.00049	.0019	.464	
140	.027	.00057	.0022	.631	
160	.029	.00067	.0026	.825	
180	.031	.00075	.0029	1.044	
200	.033	.00083	.0032	1.289	
220	.034	.00091	.0035	1.559	
240	.036	.00101	.0039	1.855	
260	.037	.00109	.0042	2.178	
280	.039	.00117	.0045	2.525	
300	.040	.00125	.0048	2.899	

5 Ohms Resistance,

Diam.	Area	Weight per foot	Total Weight	Cost
.009	.00008	.0003	.010	
.013	.00013	.0005	.041	
.016	.00021	.0008	.093	
.019	.00026	.0010	.165	
.021	.00034	.0013	.258	
.023	.00042	.0016	.371	
.024	.00047	.0018	.505	
.026	.00054	.0021	.660	
.028	.00060	.0023	.835	
.029	.00067	.0026	1.031	
.031	.00073	.0028	1.247	
.032	.00080	.0031	1.485	
.034	.00088	.0034	1.742	
.035	.00093	.0036	2.021	
.036	.00101	.0039	2.320	

6 Ohms Resistance.

Diam.	Area.	Weight per foot.	Total Weight	Cost.
20	.008	.00005	.0002	.009
40	.012	.00010	.0004	.034
60	.015	.00016	.0006	.077
80	.017	.00023	.0009	.138
100	.019	.00026	.0010	.215
120	.021	.00034	.0013	.309
140	.023	.00040	.0015	.421
160	.024	.00044	.0017	.550
180	.025	.00049	.0019	.696
200	.027	.00057	.0022	.859
220	.028	.00062	.0024	1.039
240	.029	.00067	.0026	1.237
260	.030	.00073	.0028	1.452
280	.032	.00078	.0030	1.684
300	.033	.00083	.0032	1.933

7 Ohms Resistance.

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.008	.00005	.0002	.007	
.011	.00010	.0004	.029	
.015	.00016	.0006	.066	
.015	.00018	.0007	.118	
.017	.00023	.0009	.184	
.020	.00029	.0011	.265	
.021	.00034	.0013	.361	
.022	.00039	.0015	.471	
.024	.00044	.0017	.596	
.025	.00047	.0018	.736	
.026	.00052	.0020	.891	
.027	.00057	.0022	1.060	
.028	.00062	.0024	1.244	
.029	.00067	.0026	1.443	
.031	.00073	.0028	1.657	

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8 Ohms Resistance

	Diam.	Area.	Weight per foot.	Total Weight	Cost
20	.007	.00005	.0002	.006	
40	.010	.00008	.0003	.026	
60	.013	.00013	.0005	.058	
80	.014	.00016	.0006	.103	
100	.016	.00021	.0008	.161	
120	.019	.00026	.0010	.232	
140	.020	.00029	.0011	.316	
160	.021	.00034	.0013	.412	
180	.022	.00040	.0015	.522	
200	.023	.00042	.0016	.644	
220	.024	.00047	.0018	.780	
240	.025	.00049	.0019	.928	
260	.026	.00054	.0021	1.089	
280	.028	.00060	.0023	1.263	
300	.028	.00062	.0024	1.450	

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9 Ohms Resistance

Diam	Area	Weight per foot.	Total Weight	Cost.
.007	.00003	.0001	.006	
.010	.00008	.0003	.023	
.012	.00010	.0004	.052	
.014	.00016	.0006	.093	
.015	.00018	.0007	.145	
.017	.00023	.0009	.209	
.019	.00026	.0010	.285	
.020	.00029	.0011	.372	
.021	.00034	.0013	.470	
.022	.00036	.0014	.581	
.023	.00042	.0016	.703	
.024	.00044	.0017	.836	
.025	.00049	.0019	.981	
.026	.00052	.0020	1.138	
.028	.00054	.0021	1.306	

10 Ohm Resistance.

	Diam.	Area	Weight per foot	Total Weight	Cost.
20	.0065	.00003	.0001	.005	
40	.009	.00008	.0003	.021	
60	.012	.00010	.0004	.046	
80	.013	.00013	.0005	.083	
100	.015	.00018	.0007	.129	
120	.016	.00021	.0008	.186	
140	.017	.00023	.0009	.253	
160	.019	.00026	.0010	.330	
180	.020	.00031	.0012	.417	
200	.021	.00034	.0013	.515	
220	.022	.00036	.0014	.624	
240	.023	.00042	.0016	.742	
260	.024	.00044	.0017	.871	
280	.024	.00047	.0018	1.010	
300	.025	.00049	.0019	1.160	

26 Distance	Length Cond.	½ Ohm Resistance Diam.	Area.	Weight per foot	Total Weight	Cost
320	640	.117		.0412	26.392	
340	680	.120		.0438	29.793	
360	720	.125		.0464	33.400	
380	760	.127		.0490	37.215	
400	800	.130		.0515	41.236	
420	840	.134		.0541	45.452	
440	880	.137		.0567	49.892	
460	920	.140		.0593	54.534	
480	960	.143		.0619	59.380	
500	1000	.146		.0644	64.431	
520	1040	.149		.0670	69.684	
540	1080	.152		.0696	75.151	
560	1120	.154		.0721	80.820	
580	1160	.157		.0747	86.676	
600	1200	.160		.0773	92.760	

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1 Ohm Resistance Diam.	Area.	Weight per foot	Total Weight	Cost.
.083	.0053	.0206	13.192	
.085		.0219	14.894	
.088	.0060	.0232	16.696	
.090		.0245	18.605	
.092	.0067	.0258	20.616	
.095		.0271	22.722	
.096		.0284	24.944	
.099		.0297	27.262	
.102		.0310	29.684	
.103		.0322	32.210	
.105	.0087	.0335	34.840	
.107		.0348	37.569	
.109		.0361	40.404	
.111		.0374	43.331	
.113	.0100	.0387	46.384	

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1/2 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Costs
1320 .068		.0137	8,800	
1340 .070		.0146	9,932	
1360 .072	.0040	.0155	11,136	
1380 .073		.0163	12,398	
1400 .075		.0172	13,748	
1420 .077	.0047	.0180	15,153	
1440 .079		.0189	16,636	
1460 .081		.0198	18,181	
1480 .083	.0053	.0206	19,796	
1500 .084		.0215	21,480	
1520 .086		.0223	23,232	
1540 .088	.0060	.0232	25,054	
1560 .089		.0240	26,944	
1580 .091		.0249	28,896	
1600 .092	.0067	.0258	30,932	

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2 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Costs
.058	.0027	.0103	6,600	
.060		.0110	7,449	
.062	.0030	.0116	8,352	
.064		.0123	9,305	
.065	.0033	.0129	10,312	
.067		.0135	11,365	
.068	.0037	.0142	12,476	
.070		.0148	13,636	
.072	.0040	.0155	14,848	
.073		.0161	16,111	
.074	.0044	.0168	17,424	
.076		.0174	18,791	
.077	.0047	.0180	20,208	
.079		.0187	21,672	
.081		.0194	23,200	

2½ Ohms Resistance

	Diam.	Area.	Weight per foot	Total Weight	Cost.
220	.052		.0082	5.280	
240	.054		.0088	5.960	
260	.055		.0093	6.684	
280	.057		.0098	7.445	
300	.058	.0027	.0103	8.248	
320	.060		.0108	9.093	
340	.061		.0113	9.984	
360	.063		.0119	10.910	
380	.064		.0124	11.880	
400	.065	.0033	.0129	12.890	
420	.067		.0134	13.936	
440	.068		.0139	15.035	
460	.069		.0144	16.168	
480	.070		.0149	17.341	
500	.072	.0040	.0155	18.560	

3 Ohms Resistance.

Diam.	Area.	Weight per foot	Total Weight	Cost.
.048	.0018	.0069	4.404	
.049	.0019	.0073	4.966	
.051	.0020	.0077	5.568	
.052	.0021	.0082	6.204	
.053	.0022	.0086	6.872	
.055	.0023	.0090	7.576	
.056	.0025	.0095	8.316	
.057	.0026	.0099	9.090	
.058	.0027	.0103	9.900	
.060	.0028	.0107	10.740	
.061	.0029	.0112	11.616	
.062	.0030	.0116	12.527	
.063	.0031	.0120	13.472	
.064	.0032	.0125	14.448	
.065	.0033	.0129	15.464	

4 Ohms Resistance

Diam.	Area	Weight per foot	Total Weight	Cost
320 .041	.0013	.0052	3,300	
340 .043	.0014	.0055	3,724	
360 .044	.0015	.0058	4,176	
380 .045	.0016	.0061	4,652	
400 .046	.0017	.0065	5,156	
420 .047		.0068	5,681	
440 .048	.0018	.0071	6,236	
460 .050	.0019	.0074	6,816	
480 .051	.0020	.0078	7,420	
500 .052	.0021	.0081	8,053	
520 .053	.0022	.0084	8,712	
540 .054		.0087	9,393	
560 .055	.0023	.0090	10,100	
580 .056	.0024	.0093	10,834	
600 .057	.0025	.0097	11,596	

5 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.037	.0011	.0041	2,640	
.038		.0044	2,979	
.039	.0012	.0046	3,340	
.040		.0049	3,722	
.041	.0013	.0052	4,156	
.042	.0014	.0054	4,545	
.043	.0015	.0057	4,988	
.044		.0059	5,453	
.045	.0016	.0062	5,940	
.046	.0017	.0064	6,443	
.047	.0017	.0067	6,968	
.048	.0018	.0070	7,515	
.049	.0019	.0072	8,084	
.050		.0075	8,668	
.051	.0020	.0077	9,280	

6 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost.
320 .034	.0009	.0034	2,200	
340 .035		.0037	2,483	
360 .036	.0010	.0039	2,784	
380 .037		.0041	3,101	
400 .038	.0011	.0043	3,436	
420 .039	.0012	.0045	3,788	
440 .040	.0012	.0047	4,156	
460 .040		.0050	4,537	
480 .041	.0013	.0052	4,948	
500 .042	.0014	.0054	5,369	
520 .043	.0015	.0056	5,808	
540 .044	.0015	.0058	6,262	
560 .045	.0016	.0060	6,736	
580 .045	.0016	.0062	7,223	
600 .046	.0017	.0065	7,732	

7 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost.
.031	.0008	.0029	1,884	
.032	.0008	.0031	2,128	
.033		.0033	2,384	
.034	.0009	.0035	2,658	
.035		.0037	2,944	
.036	.0010	.0039	3,247	
.037	.0011	.0041	3,564	
.037	.0011	.0042	3,895	
.038		.0044	4,240	
.039	.0012	.0046	4,602	
.040		.0048	4,976	
.041		.0050	5,368	
.041	.0013	.0052	5,772	
.042		.0053	6,167	
.042		.0055	6,628	

8 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost
3°0 .029	.0007	.0026	1.648	
3°40 .030		.0027	1.862	
3°60 .031	.0008	.0029	2.088	
3°80 .032	.0008	.0031	2.326	
4°00 .033	.0008	.0032	2.576	
4°20 .034	.0009	.0034	2.841	
4°40 .035	.0009	.0036	3.120	
4°60 .035		.0037	3.408	
4°80 .036	.0010	.0039	3.712	
5°00 .037		.0040	4.027	
5°20 .037	.0011	.0042	4.356	
5°40 .038		.0044	4.697	
5°60 .039	.0012	.0045	5.052	
5°80 .039		.0047	5.417	
6°00 .040	.0013	.0048	5.800	

9 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost
.028	.0006	.0023	1.488	
.028	.0006	.0024	1.678	
.029	.0007	.0026	1.880	
.030		.0027	2.096	
.031		.0029	2.324	
.032	.0008	.0030	2.560	
.033	.0008	.0032	2.812	
.033		.0033	3.071	
.034	.0009	.0035	3.344	
.034	.0009	.0036	3.629	
.035		.0037	3.924	
.036	.0010	.0039	4.233	
.037		.0040	4.552	
.037	.0011	.0042	4.882	
.038		.0043	5.224	

10 Ohms Resistance

Diam.	Area.	Weight per foot	Total Weight	Cost.
320 .026	.0005	.0021	1.320	
340 .027	.0006	.0022	1.490	
360 .028	.0006	.0023	1.668	
380 .029	.0007	.0025	1.861	
400 .029	.0007	.0026	2.060	
420 .030	.0007	.0027	2.272	
440 .030	.0007	.0028	2.496	
460 .032	.0008	.0030	2.726	
480 .032	.0008	.0031	2.968	
500 .033	.0008	.0032	3.221	
520 .034	.0009	.0034	3.484	
540 .034	.0009	.0035	3.757	
560 .035	.0009	.0036	4.040	
580 .035	.	.0037	4.333	
600 .036	.0010	.0039	4.640	

1/2 Ohm Resistance

Distance	Length of Cond.	Diam.	Area.	Weight per foot	Total Weight	Cost.
620	1240	.163		.0779	99.067	
640	1280	.165		.0825	105.565	
660	1320	.168		.0850	112.263	
680	1360	.170		.0876	119.170	
700	1400	.173		.0902	126.287	
720	1440	.175		.0928	133.603	
740	1480	.178		.0954	141.128	
760	1520	.180		.0979	148.860	
780	1560	.182		.1005	156.798	
800	1600	.185		.1030	164.949	
820	1640	.187		.1056	173.292	
840	1680	.189		.1082	181.848	
860	1720	.191		.1108	190.611	
880	1760	.194		.1134	199.579	
900	1800	.196		.1160	208.754	

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1 Ohm Resistance.

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.115		.0400	49.526	
.117		.0413	52.772	
.119		.0425	56.123	
.120		.0438	59.576	
.122		.0451	63.144	
.124		.0464	66.802	
.126		.0477	70.564	
.127		.0490	74.430	
.129		.0503	78.399	
.131		.0515	82.475	
.132		.0528	86.646	
.134		.0541	90.924	
.135		.0554	95.306	
.137		.0567	99.790	
.138		.0580	104.377	

1½ Ohms Resistance

Diam.	Area	Weight per foot	Total Weight	Cost.
.094		.0266	33.027	
.095		.0275	35.193	
.097		.0283	37.427	
.098		.0292	39.729	
.100		.0301	42.096	
.101		.0309	44.534	
.103		.0318	47.043	
.104		.0326	49.620	
.105		.0335	52.266	
.107		.0343	54.983	
.108		.0352	57.764	
.109		.0361	60.616	
.111		.0369	63.537	
.112		.0378	66.526	
.113		.0387	69.585	

2 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.081		.0200	24.771	
.083		.0206	26.395	
.084		.0213	28.070	
.085		.0219	29.798	
.086		.0226	31.572	
.088		.0232	33.401	
.089		.0239	35.282	
.090		.0245	37.215	
.091		.0251	39.200	
.092		.0258	41.237	
.093		.0264	43.323	
.095		.0271	45.462	
.096		.0277	47.903	
.097		.0284	49.895	
.098		.0290	52.189	

2½ Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost
.073		.0160	19.820	
.074		.0165	21.119	
.075		.0170	22.459	
.076		.0175	23.842	
.077		.0180	25.257	
.078		.0186	26.721	
.079		.0191	28.226	
.080		.0196	29.772	
.082		.0201	31.360	
.083		.0206	32.990	
.084		.0211	34.658	
.085		.0216	36.370	
.086		.0222	38.122	
.087		.0227	39.916	
.088		.0232	41.751	

3 Ohms Resistance

Diam	Area	Weight per foot.	Total Weight	Cost.
.066		.0133	16.514	
.067		.0138	17.596	
.068		.0142	18.714	
.070		.0146	19.875	
.071		.0150	21.048	
.071		.0155	22.267	
.073		.0159	23.521	
.073		.0163	24.810	
.074		.0168	26.133	
.075		.0172	27.492	
.076		.0176	28.882	
.077		.0180	30.308	
.078		.0185	31.769	
.079		.0189	33.263	
.080		.0193	34.792	

4 Ohms Resistance

Diam.	Area.	Weight per ft.	Total Weight	Cost.
.057		.0100	12,383	
.058		.0103	13,194	
.059		.0106	14,032	
.060		.0110	14,895	
.061		.0113	15,786	
.062		.0116	16,700	
.063		.0119	17,641	
.064		.0123	18,608	
.064		.0126	19,600	
.065		.0129	20,619	
.066		.0132	21,662	
.067		.0135	22,731	
.068		.0139	23,826	
.068		.0142	24,947	
.069		.0145	26,094	

5 Ohms Resistance.

Diam	Area	Weight per ft.	Total Weight	Cost.
.051		.0080	9,907	
.052		.0083	10,556	
.053		.0085	11,227	
.054		.0088	11,917	
.055		.0090	12,629	
.055		.0093	13,360	
.056		.0095	14,113	
.057		.0098	14,886	
.058		.0101	15,680	
.058		.0103	16,495	
.059		.0106	17,329	
.060		.0108	18,185	
.061		.0111	19,061	
.061		.0113	19,958	
.062		.0116	20,875	

6 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.047		.0067	8,255	
.048		.0069	8,797	
.048		.0071	9,355	
.049		.0073	9,931	
.050		.0075	10,524	
.051		.0077	11,134	
.051		.0080	11,761	
.052		.0082	12,405	
.053		.0084	13,067	
.053		.0086	13,746	
.054		.0088	14,441	
.055		.0090	15,154	
.055		.0092	15,886	
.056		.0095	16,632	
.057		.0097	17,388	

7 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.043		.0057	7,076	
.044		.0059	7,540	
.045		.0061	8,019	
.046		.0063	8,512	
.046		.0064	9,021	
.047		.0066	9,543	
.047		.0068	10,086	
.048		.0070	10,633	
.049		.0072	11,200	
.049		.0073	11,782	
.050		.0075	12,378	
.051		.0077	12,989	
.051		.0079	13,615	
.052		.0081	14,256	
.052		.0083	14,911	

8 Ohms Resistance.

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.041		.0050	6.192	
.041		.0052	6.598	
.042		.0053	7.017	
.043		.0055	7.448	
.043		.0056	7.893	
.044		.0058	8.350	
.044		.0060	8.821	
.045		.0061	9.304	
.046		.0063	9.800	
.046		.0064	10.309	
.047		.0066	10.893	
.047		.0068	11.366	
.048		.0069	11.913	
.048		.0071	12.474	
.049		.0073	13.047	

9 Ohms Resistance.

Diam.	Area.	Weight per foot.	Total Weight	Cost.
.038		.0044	5.580	
.039		.0046	5.945	
.040		.0047	6.323	
.040		.0049	6.712	
.041		.0050	7.016	
.041		.0052	7.422	
.042		.0053	7.840	
.042		.0054	8.270	
.043		.0056	8.711	
.044		.0057	9.164	
.044		.0059	9.627	
.045		.0060	10.103	
.045		.0062	10.590	
.046		.0063	11.088	
.046		.0064	11.598	

10 Ohms Resistance

Diam.	Area.	Weight per ft.	Total Weight.	Cost.
.036		.0040	4.953	
.037		.0041	5.277	
.038		.0043	5.612	
.038		.0044	5.958	
.039		.0045	6.314	
.039		.0046	6.680	
.040		.0048	7.056	
.040		.0049	7.443	
.041		.0050	7.840	
.041		.0052	8.247	
.042		.0053	8.665	
.042		.0054	9.092	
.043		.0055	9.531	
.043		.0057	9.979	
.044		.0058	10.438	

1 Ohm Resistance

Diameter	Length of Cond.	Diam.	Area.	Weight per foot.	Value of the Weight	Cost.
920	1840	.198			218.100	
940	1880	.200			227.686	
960	1920	.202			237.478	
980	1960	.204			247.464	
1000	2000	.206			257.680	
1020	2040	.208			268.090	
1040	2080	.210			278.706	
1060	2120	.212			290.866	
1080	2160	.214			300.558	
1100	2200	.216			311.792	
1120	2240	.218			323.234	
1140	2280	.220			334.880	
1160	2320	.222			346.734	
1180	2360	.224			358.794	
1200	2400	.226			371.058	

1 Ohm Resistance

Diam.	Area.	Weight per foot.	Value of the Weight	Cost.
.140			109.050	
.141			113.843	
.143			118.739	
.144			123.732	
.146			128.840	
.147			134.045	
.149			139.353	
.150			145.433	
.152			150.279	
.153			155.896	
.154			161.617	
.156			167.440	
.157			173.367	
.159			179.397	
.160			185.529	

1/2 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost
.114			72.700	
.116			75.895	
.117			79.159	
.118			82.488	
.119			85.893	
.120			89.363	
.122			92.902	
.123			96.955	
.124			100.186	
.125			103.931	
.126			107.745	
.127			111.627	
.128			115.578	
.129			119.598	
.131			123.686	

2 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Cost
.099			54.525	
.100			56.922	
.101			59.370	
.102			61.866	
.103			64.420	
.104			67.023	
.105			69.677	
.106			72.717	
.107			75.140	
.108			77.948	
.109			80.809	
.110			83.720	
.111			86.684	
.112			89.699	
.113			92.765	

2½ Ohms Resistance

Diam.	Area	Weight per foot	Total Weight	Cost
.089			43.620	
.090			45.537	
.090			47.496	
.091			49.495	
.092			51.536	
.093			53.618	
.094			55.741	
.095			58.173	
.096			60.112	
.097			62.358	
.098			64.647	
.099			66.976	
.099			69.347	
.100			71.759	
.101			74.212	

3 Ohms Resistance

Diam.	Area	Weight per foot	Total Weight	Cost
.081			36.350	
.082			37.948	
.083			39.580	
.083			41.244	
.084			42.947	
.085			44.682	
.086			46.451	
.087			48.478	
.088			50.093	
.088			51.965	
.089			53.872	
.090			55.813	
.091			57.789	
.092			59.799	
.092			61.843	

4 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Costs
			27,263	
			28,461	
			29,685	
			30,933	
			32,210	
			33,511	
			34,838	
			36,358	
			37,570	
			38,974	
			40,404	
			41,860	
			43,342	
			44,849	
			46,382	

5 Ohms Resistance

Diam.	Area.	Weight per foot.	Total Weight	Costs
			21,810	
			22,769	
			23,748	
Costs			24,746	
			25,768	
			26,809	
			27,871	
			29,087	
			30,056	
			31,179	
			32,323	
			33,488	
			34,673	
			35,879	
			37,106	

6 Ohm Resistance

Diam.	Area	Weight per foot	Voltage Weight	Cost
			18,175	
			18,974	
			19,790	
			20,622	
			21,473	
			22,341	
			23,226	
			24,239	
			25,047	
			25,983	
			26,936	
			27,907	
			28,895	
			29,733	
			30,922	

7 Ohm Resistance

Diam.	Area	Weight per foot	Voltage Weight	Cost
			15,579	
			16,263	
			16,963	
			17,676	
			18,406	
			19,149	
			19,908	
			20,776	
			21,468	
			22,271	
			23,088	
			23,920	
			24,767	
			25,628	
			26,504	

8 Ohms Resistance

Diam.	Area	Weight per foot	Total Weight	Cost
			13,631	
			14,230	
			14,842	
			15,467	
			16,105	
			16,756	
			17,419	
			18,179	
			18,785	
			19,487	
			20,208	
			20,930	
			21,671	
			22,425	
			23,191	

9 Ohms Resistance.

Diam.	Area	Weight per foot	Total Weight	Cost
			12,117	
			12,649	
			13,193	
			13,748	
			14,315	
			14,894	
			15,484	
			16,159	
			16,698	
			17,322	
			17,957	
			18,605	
			19,263	
			19,933	
			20,614	

10 Ohms Resistance.

Diam.	Area.	Weight per foot	Total Weight	Cost.
			10,905	
			11,384	
			11,874	
			12,373	
			12,884	
			13,405	
			13,935	
			14,543	
			15,028	
			15,590	
			16,162	
			16,744	
			17,337	
			17,940	
			18,553	

Distance	Length of Conductor	½ Ohm. Diam. inches	Area sq. in.	Weight per foot lbs.	Total Weight lbs.	Cost $
5000	10000	.461	.1672	.6443	6443.00	
5020	10040	.462	.1678	.6469	6494.65	
5040	10080	.463	.1685	.6495	6546.50	
5060	10120	.464	.1692	.6520	6598.56	
5080	10160	.465	.1698	.6546	6650.82	
5100	10200	.466	.1705	.6572	6703.30	
5120	10240	.467	.1712	.6598	6755.98	
5140	10280	.468	.1719	.6623	6808.86	
5160	10320	.469	.1725	.6649	6861.95	
5180	10360	.470	.1732	.6675	6915.25	
5200	10400	.471	.1739	.6701	6968.75	
5220	10440	.471	.1745	.6727	7022.46	
5240	10480	.472	.1752	.6752	7076.37	
5260	10520	.473	.1759	.6778	7130.49	
5280	10560	.474	.1765	.6804	7184.82	

1 Ohm. Diam.	Area	Weight per foot.	Total Weight	Cost
.326	.0836	.3222	3221.50	
.327	.0839	.3235	3247.33	
.328	.0843	.3248	3273.25	
.328	.0846	.3260	3299.28	
.329	.0849	.3273	3325.41	
.329	.0853	.3286	3351.65	
.330	.0856	.3299	3377.99	
.331	.0860	.3312	3404.43	
.331	.0863	.3325	3430.98	
.332	.0866	.3338	3457.63	
.333	.0870	.3351	3484.38	
.333	.0873	.3364	3511.23	
.334	.0876	.3376	3538.19	
.335	.0880	.3389	3565.25	
.335	.0883	.3402	3592.41	

1/2 Ohm.

Diam.	Area.	Weight per foot	Total weight	Cost
.266	.0557	.2148	2147.67	
.267	.0559	.2156	2164.88	
.267	.0562	.2165	2182.17	
.268	.0564	.2173	2199.52	
.268	.0566	.2182	2216.94	
.269	.0568	.2191	2234.43	
.270	.0571	.2199	2251.99	
.270	.0573	.2208	2269.62	
.271	.0575	.2216	2287.32	
.271	.0577	.2225	2305.08	
.272	.0580	.2234	2322.92	
.272	.0582	.2242	2340.82	
.273	.0584	.2251	2358.79	
.273	.0586	.2259	2376.83	
.274	.0588	.2268	2394.94	

2 Ohms.

Diam.	Area	Weight per foot	Total weight	Cost.
.231	.0418	.1611	1610.75	
.231	.0420	.1617	1623.66	
.232	.0421	.1624	1636.63	
.232	.0423	.1630	1649.64	
.233	.0425	.1637	1662.71	
.233	.0426	.1643	1675.83	
.233	.0428	.1650	1689.00	
.234	.0430	.1656	1702.22	
.234	.0431	.1662	1715.49	
.235	.0433	.1669	1728.81	
.235	.0435	.1675	1742.19	
.236	.0436	.1682	1755.62	
.236	.0438	.1688	1769.09	
.237	.0440	.1695	1782.62	
.237	.0441	.1701	1796.21	

2½ Ohms.

Diam.	Area.	Weight per foot.	Total weight	Cost.
.206	.0334	.1289	1288.60	
.207	.0336	.1294	1298.93	
.207	.0337	.1299	1309.30	
.208	.0338	.1304	1319.71	
.208	.0340	.1309	1330.16	
.208	.0341	.1314	1340.66	
.209	.0342	.1320	1351.20	
.209	.0344	.1325	1361.77	
.210	.0345	.1330	1372.39	
.210	.0346	.1335	1383.05	
.210	.0348	.1340	1393.75	
.211	.0349	.1345	1404.49	
.211	.0350	.1350	1415.27	
.212	.0352	.1356	1426.10	
.212	.0353	.1361	1436.96	

3 Ohms.

Diam.	Area.	Weight per foot.	Total weight	Cost.
.188	.0279	.1074	1073.83	
.189	.0280	.1078	1082.44	
.189	.0281	.1083	1091.08	
.189	.0282	.1087	1099.76	
.190	.0283	.1091	1108.47	
.190	.0284	.1095	1117.22	
.191	.0285	.1100	1126.00	
.191	.0287	.1104	1134.81	
.191	.0288	.1108	1143.66	
.192	.0289	.1113	1152.54	
.192	.0290	.1117	1161.46	
.192	.0291	.1121	1170.41	
.193	.0292	.1125	1179.40	
.193	.0293	.1130	1188.42	
.194	.0294	.1134	1197.47	

4 Ohms.

Diam.	Area.	Weight per foot.	Total weight	Costs
.163	.0209	.0806	805.38	
.163	.0210	.0809	811.83	
.164	.0211	.0812	818.31	
.164	.0212	.0815	824.82	
.164	.0212	.0818	831.35	
.165	.0213	.0822	837.91	
.165	.0214	.0825	844.50	
.165	.0215	.0828	851.11	
.166	.0216	.0831	857.75	
.166	.0217	.0835	864.41	
.166	.0218	.0838	871.10	
.167	.0218	.0841	877.81	
.167	.0219	.0844	884.55	
.167	.0220	.0847	891.31	
.168	.0221	.0851	898.10	

5 Ohms.

Diam.	Area.	Weight per foot.	Total weight	Costs
.146	.0167	.0644	644.30	
.146	.0168	.0647	649.47	
.146	.0169	.0650	654.65	
.147	.0169	.0652	659.86	
.147	.0170	.0655	665.08	
.147	.0171	.0657	670.33	
.148	.0171	.0660	675.60	
.148	.0172	.0662	680.89	
.148	.0173	.0665	686.20	
.148	.0173	.0668	691.53	
.149	.0174	.0670	696.88	
.149	.0175	.0673	702.25	
.149	.0175	.0675	707.64	
.150	.0176	.0678	713.05	
.150	.0177	.0680	718.48	

6 Ohms.

Diam.	Area.	Weight per foot.	Total weight.	Cost.
.133	.0139	.0537	536.92	
.133	.0140	.0539	541.22	
.134	.0141	.0541	545.54	
.134	.0141	.0543	549.88	
.134	.0142	.0546	554.24	
.135	.0142	.0548	558.61	
.135	.0143	.0550	563.00	
.135	.0143	.0552	567.41	
.135	.0144	.0554	571.83	
.136	.0144	.0556	576.27	
.136	.0145	.0559	580.73	
.136	.0146	.0561	585.21	
.136	.0146	.0563	589.70	
.137	.0147	.0565	594.21	
.137	.0147	.0567	598.74	

7 Ohms.

Diam.	Area.	Weight per foot.	Total weight.	Cost.
.123	.0119	.0460	460.21	
.124	.0120	.0462	463.90	
.124	.0120	.0464	467.61	
.124	.0121	.0466	471.33	
.124	.0121	.0468	475.06	
.125	.0122	.0469	478.81	
.125	.0122	.0471	482.57	
.125	.0123	.0473	486.35	
.125	.0123	.0475	490.14	
.126	.0124	.0477	493.95	
.126	.0124	.0479	497.77	
.126	.0125	.0481	501.60	
.126	.0125	.0482	505.46	
.126	.0126	.0484	509.32	
.127	.0126	.0486	513.20	

8 Chines.

Diam.	Area.	Weight per foot.	Total weight.	Cost.
.115	.0105	.0403	402.69	
.116	.0105	.0404	405.92	
.116	.0105	.0406	409.16	
.116	.0106	.0408	412.41	
.116	.0106	.0409	415.68	
.116	.0107	.0411	418.96	
.117	.0107	.0412	422.25	
.117	.0108	.0414	425.55	
.117	.0108	.0416	428.87	
.117	.0108	.0417	432.21	
.118	.0109	.0419	435.55	
.118	.0109	.0421	438.90	
.118	.0110	.0422	442.27	
.118	.0110	.0424	445.66	
.119	.0110	.0425	449.05	

9 Chines.

Diam.	Area.	Weight per foot.	Total weight.	Cost.
.109	.0093	.0358	357.94	
.109	.0093	.0359	360.81	
.109	.0094	.0361	363.69	
.109	.0094	.0362	366.59	
.110	.0094	.0364	369.49	
.110	.0095	.0365	372.41	
.110	.0095	.0367	375.33	
.110	.0096	.0368	378.27	
.110	.0096	.0369	381.22	
.111	.0096	.0371	384.18	
.111	.0097	.0372	387.15	
.111	.0097	.0374	390.14	
.111	.0097	.0375	393.13	
.112	.0098	.0377	396.14	
.112	.0098	.0378	399.16	

10 Ohms.

Diam.	Area	Weight per foot.	Total weight.	Cost.
.103	.0084	.0322	322.15	
.103	.0084	.0324	324.73	
.104	.0084	.0325	327.33	
.104	.0085	.0326	329.93	
.104	.0085	.0327	332.54	
.104	.0085	.0329	335.17	
.104	.0086	.0330	337.80	
.105	.0086	.0331	340.44	
.105	.0086	.0333	343.10	
.105	.0087	.0334	345.76	
.105	.0087	.0335	348.44	
.105	.0087	.0336	351.12	
.106	.0088	.0338	353.82	
.106	.0088	.0339	356.53	
.106	.0088	.0340	359.24	

Distance	Length of 1/2 Chain	1/2 Chain. Diam.	Area.	Weight per foot.	Total Weight	Cost.
4700	9400	.447	.1571	.6056	5693.16	1423.29
4720	9440	.448	.1578	.6082	5741.61	1435.45
4740	9480	.449	.1585	.6108	5790.35	1447.59
4760	9520	.450	.1591	.6134	5839.31	1459.83
4780	9560	.451	.1598	.6160	5888.51	1472.13
4800	9600	.452	.1605	.6185	5937.87	1484.47
4820	9640	.453	.1611	.6211	5987.45	1496.86
4840	9680	.454	.1618	.6237	6037.25	1509.31
4860	9720	.455	.1625	.6263	6087.24	1521.81
4880	9760	.456	.1631	.6288	6137.45	1534.36
4900	9800	.457	.1638	.6314	6187.86	
4920	9840	.458	.1645	.6340	6238.47	
4940	9880	.459	.1651	.6366	6289.29	
4960	9920	.459	.1658	.6391	6340.33	
4980	9960	.460	.1665	.6417	6391.56	

1 Chain. Diam.	Area.	Weight per foot.	Total weight	Cost.
.316	.0785	.3028	2846.58	
.317	.0789	.3041	2870.81	
.318	.0793	.3054	2895.18	
.318	.0796	.3067	2919.66	
.319	.0799	.3080	2944.26	
.320	.0803	.3093	2968.94	
.320	.0806	.3106	2993.73	
.321	.0809	.3119	3018.63	
.322	.0813	.3132	3043.62	
.322	.0816	.3144	3068.73	
.323	.0819	.3157	3093.93	
.324	.0823	.3170	3119.24	
.324	.0826	.3183	3144.65	
.325	.0829	.3196	3170.17	
.326	.0833	.3209	3195.78	

1½ Ohms.

Diam.	Area.	Weight per foot.	Total weight	Cost.
.258	.0524	.2019	1897.72	
.259	.0526	.2027	1913.87	
.260	.0528	.2036	1930.12	
.260	.0530	.2045	1946.44	
.260	.0533	.2053	1962.84	
.261	.0535	.2062	1979.29	
.262	.0537	.2070	1995.82	
.262	.0539	.2079	2012.42	
.263	.0542	.2088	2029.08	
.263	.0544	.2096	2045.82	
.264	.0546	.2105	2062.62	
.264	.0548	.2113	2079.49	
.265	.0550	.2122	2096.43	
.265	.0553	.2130	2113.44	
.266	.0555	.2139	2130.52	

2 Ohms.

Diam.	Area.	Weight per foot.	Total weight	Cost.
.224	.0393	.1514	1423.29	
.224	.0395	.1521	1435.40	
.225	.0396	.1527	1447.59	
.225	.0398	.1534	1459.83	
.226	.0400	.1540	1472.13	
.226	.0401	.1546	1484.47	
.226	.0403	.1553	1496.86	
.227	.0405	.1559	1509.31	
.227	.0406	.1566	1521.81	
.228	.0408	.1572	1534.36	
.228	.0410	.1580	1546.97	
.229	.0411	.1585	1559.62	
.229	.0413	.1592	1572.32	
.230	.0415	.1598	1585.08	
.230	.0416	.1604	1597.89	

2½ ohms.

Diam.	Area	Weight per foot	Total Weight	Cost
.200	.0314	.1211	1138.63	
.200	.0316	.1216	1148.32	
.201	.0317	.1222	1158.07	
.201	.0318	.1227	1167.86	
.202	.0320	.1232	1177.70	
.202	.0321	.1237	1187.57	
.203	.0322	.1242	1197.49	
.203	.0324	.1247	1207.45	
.203	.0325	.1253	1217.45	
.204	.0326	.1258	1227.49	
.204	.0328	.1263	1237.57	
.205	.0329	.1268	1247.69	
.205	.0330	.1273	1257.86	
.205	.0332	.1278	1268.07	
.206	.0333	.1283	1278.31	

3 ohms.

Diam.	Area.	Weight per foot	Total Weight	Cost.
.183	.0262	.1009	948.86	
.183	.0263	.1014	956.94	
.183	.0264	.1018	965.06	
.184	.0265	.1022	973.22	
.184	.0266	.1027	981.42	
.185	.0268	.1031	989.65	
.185	.0269	.1035	997.91	
.185	.0270	.1040	1006.21	
.186	.0271	.1044	1014.54	
.186	.0272	.1048	1022.93	
.186	.0273	.1052	1031.31	
.187	.0274	.1057	1039.75	
.187	.0275	.1061	1048.22	
.188	.0276	.1065	1056.72	
.188	.0278	.1070	1065.26	

4 Ohms.

Diam.	Area	Weight per foot.	Total Weight	Cost.
.158	.0197	.0757	711.65	
.158	.0197	.0760	717.70	
.159	.0198	.0764	723.80	
.159	.0199	.0767	729.92	
.159	.0200	.0770	736.07	
.160	.0201	.0773	742.24	
.160	.0202	.0777	748.43	
.160	.0202	.0780	754.66	
.161	.0203	.0783	760.91	
.161	.0204	.0786	767.20	
.161	.0205	.0789	773.48	
.162	.0206	.0793	779.81	
.162	.0207	.0796	786.16	
.162	.0207	.0799	792.54	
.163	.0208	.0802	798.94	

5 Ohms.

Diam.	Area	Weight per foot.	Total Weight	Cost.
.141	.0157	.0606	569.32	
.142	.0158	.0608	574.16	
.142	.0159	.0611	579.04	
.142	.0159	.0613	583.93	
.143	.0160	.0616	588.85	
.143	.0161	.0619	593.79	
.143	.0161	.0621	598.75	
.144	.0162	.0624	603.73	
.144	.0163	.0626	608.72	
.144	.0163	.0629	613.76	
.144	.0164	.0631	618.79	
.145	.0165	.0634	623.85	
.145	.0165	.0637	628.93	
.145	.0166	.0639	634.03	
.146	.0167	.0642	639.16	

6 Ohms.

Diam.	Area	Weight per foot	Total Weight	Cost
.129	.0131	.05005	474.43	
.129	.0132	.05007	478.47	
.130	.0132	.05009	482.53	
.130	.0133	.05011	486.61	
.130	.0133	.05013	490.71	
.130	.0134	.05016	494.82	
.131	.0134	.05018	498.96	
.131	.0135	.05020	503.11	
.131	.0136	.05022	507.27	
.132	.0136	.05024	511.46	
.132	.0137	.05026	515.66	
.132	.0137	.05028	519.87	
.132	.0138	.05031	524.11	
.133	.0138	.05033	528.36	
.133	.0139	.05035	532.63	

7 Ohms.

Diam.	Area.	Weight per foot	Total Weight	Cost
.120				
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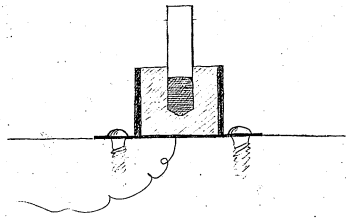

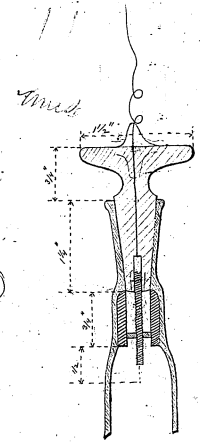

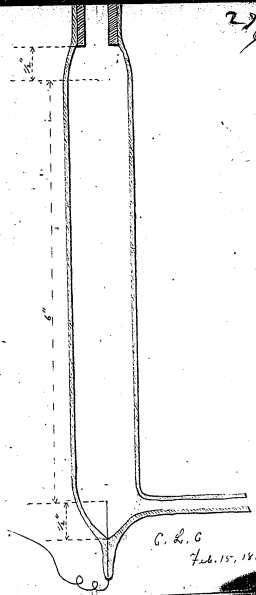

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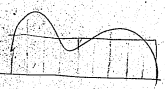

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